The attached pdf files are chapters for a course in quantitative ecology. Drafts of all 14 chapters are now available. A date is included in the chapter designator to make it possible for readers to determine whether they have previously downloaded the chapter. The chapters are simply text files so that students can print them out as needed. Modifications to take advantage of various web features will be added later. The first order of business has been to make the textual material readily available. Inasmuch as there are over 400 pages, some users may prefer to look up a topic in the Table of Contents and scan it in the pdf files without printing them all out. For classroom use, students will no doubt prefer to print out assigned and relevant chapters.

The text is intended to be essentially self-contained, but quite a few references have been included. These serve several purposes. One is to supply more information on a topic, and further sources. A second is to provide support for the text. Textbooks produced by the major publishing houses are usually reviewed by independent authorities in the subject matter field before being published (and are often reviewed in journals after publication). Also, editors and proofreaders normally go over the text quite carefully before publication. This text has not benefited from such services, so readers may want to check back to sources on occasion (I would appreciate being informed of any apparent errors, etc., at the email address linked to my name above).

The text stems originally from notes used in teaching a course in 1983 at the Center for Graduate Studies in Richland, Washington (now the Tri-Cities Branch of Washington State University). Before the most recent (1996) use, I reviewed current issues of the journal, Ecology, in an effort to determine just what statistical procedures might be most prominent in ecological papers. This turned out to be the analysis of variance by a very wide margin, so we spent a great deal of time on that subject in the course that year. While a chapter is devoted to ANOVA in the present version, I do not now believe that it should be a major component of the course. I think frequency of analyses of variance in ecological publications has more to do with editorial insistence on evidence of "statistical significance" than it does with utility as a research tool.

In my opinion, a major weakness in ecological work today stems from the use of "canned" programs without adequate understanding of the underlying techniques. Certainly the computer saves a huge amount of time and effort, and makes it possible to do computations that were not possible in the past. But it is essential to understand the basis for an analysis before applying it. Consequently the present course depends on EXCEL spreadsheets for exercises, and students are required to work through problems by direct computations so that they see how the equations "work". There is, of course, no objection on my part if you use software to check your answers! The most tedious aspect of this course is doing bootstrapping in EXCEL. Anyone who wants to use bootstrapping extensively will quickly realize the advantages of learning a programming language. Because many ecology students do not know how to program, it has seemed to be necessary to use spreadsheets to explore bootstrapping. After students learn how to bootstrap, they may want to use the Visual Basic for Applications (VBA) programs attached as EXCEL files, and described in the Appendix, for further applications of bootstrapping.

Two final comments: I suspect that most graduate programs in Ecology and Wildlife Management will not accommodate more than 4 semester hours of a "quantitative ecology" course. I have assumed that such a course will have as prerequisite one course in elementary statistics (but experience shows that most students require a refresher, hence Chapter 1). I don't believe that 4 semester hours is nearly enough background if students are to be grounded in the quantitative techniques that they will need. I suspect that this is why there are so many rather dubious analyses in the literature that appear to be based on blind use of sophisticated commercial software. I am thus uncertain how the course should be taught. In earlier efforts I tried to cover a very large amount of material. Subsequently, I felt that bootstrapping is such an important and useful development for ecologists that it "had" to be included. Doing so is likely to make it impossible to cover all the material included here in one semester.

The second comment is that the course has much about large mammals in consequence of my own recent experience. I hope it will be possible to use more examples dealing with other components of ecosystems in future revisions, and would welcome suggestions and general comments.

Dr. D. P. DeMaster kindly arranged for inclusion of the text in the National Marine Mammal Web Pages (National Marine Fisheries Service), and Chris Boucher accomplished the actual installation. Keith Brenden has been handling revisions. 

L. L. Eberhardt
2528 W. Klamath Avenue
Kennewick Washington 99336
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